

Public Lands Manual



Mississippi Forestry Commission
660 North Street, Suite 300
Jackson, Mississippi 39202
(601) 359-1386
www.mfc.ms.gov

TABLE OF CONTENTS

Introduction	1
MFC's Responsibility on Public Lands	1
Annual Work Plans, Annual Summary and Escrow	2
Examining Forest Management Goals	2
Test 1: Age Class Distribution, Stand Size and Rotation Length	2
Test 2: Consistent & Sustainable Revenues	3
School Trust Lands Classifications	3
Land Classification	3
Hunting Lease Issues on Public Lands	4
Stand Considerations on All Public Lands	4
Pine Stands	4
Hardwood Stands	5
Mixed Stands	5
Individual Management Activities	5
Main Logging Road Construction and Maintenance	5
Gate Placement and Construction	5
Property Boundary Lines	6
Tree Planting Standards on All Public Lands	7
Loblolly Pine Planting	7
Loblolly Pine Natural Regeneration	7
Hardwood Plantings	8
Hardwood Natural Regeneration	8
Checking Planting and Survival	8
Timber Sales	8
Overall Goals	9
Standards for Determining Timber Harvest Size	9
Conduction A Timber Sale	9
Examine the Plan	9
Getting the AFS	9
Timber Sale Boundary Lines	9
The Timber Sale Map	10
Setting up the Cruise	11
Cruise Requirements	11
Maximum Limits For Cruising	11
How Many Plots Should I Start With?	12
Plot Layout On Timber Sales	12
Conducting the cruise	14
Plot Protocol	14
County Crew Responsibilities	14
Moving or Forcing a Plot	14
Knowing Your Products - A Basic Guide	15
Product Diameter Limits in T-Cruise	15
The First Day In The Field	16

Validating T-Cruise Reports Before Selling	16
Timber Sale Audits	17
County Crew Responsibilities.....	17
Auditors Responsibilities.....	18
Audit Procedures	18
How to View Visited Plots in ArcMap from a .tcd	18
How To Separate Plots From A Cruise To Compare To An Audit	19
Auditing Standards.....	20
The Advertisement, Prospectus, Bid Opening and Contract	21
Basic Prospectus/Contract Contents	21
Performance Bond Limits for School Trust Lands and Other	22
Public Lands Timber Sales.....	22
Setting the Minimum Bid for Lump Sum Sales	22
Timber Sale Price Report	23
The pre-entry conference	23
Timber Sale Security	24
MFC PAC Security Field Procedures.....	24
MFC PAC Reconciliation Procedures.....	24
Final Harvest Security Field Procedures	25
Logger Evaluation and Harvest Summary.....	25
Timber Sale File Management	26
Appendix	27
Appendix A - Definitions	28
Appendix B - Abbreviations	28
Appendix C - School Trust Lands Statutes	29
§ 29-3-47. Forestry Escrow Fund	29
§ 29-3-49. Agreements For Timber Improvement.....	29
§ 29-3-45. Management Of Forest Lands	29
§ 29-3-31. Survey And Classification Of Lands In Choctaw Purchase.....	33
§ 29-3-43. Improvements On Forest Lands	33

INTRODUCTION

In accordance with Mississippi Code, Section 29-3-45, the Mississippi Forestry Commission (MFC) is charged with the responsibility of assisting Board Of Educations (BOE) with the management of all forest lands on School Trust Lands in Mississippi.

It is the aim of the MFC to maximize timber production on a sustained yield basis on School Trust Lands classified as “forest land” by the local school boards. In addition to timber production, management considerations also include wildlife, soil and water quality, aesthetics and other appropriate benefits of forestlands.

MFC’S RESPONSIBILITY ON PUBLIC LANDS

MFC is responsible for the following objectives on all public lands:

- To manage “public” school trust forested acres for the benefit of the local school boards
- To manage “other public” lands as requested (Kurtz, Camden, Jamie Whitten and various Mental Health properties)
- To serve as technical agents for the individual school boards for forest management decisions and recommendations
- To manage with the statutory goal of maximizing forest revenue in a cost effective manner

Resources:

In the State of Mississippi, there are approximately 464,483 acres forested public lands. Of these 464,483 acres, there are:

- ? +/- acres are manageable forest lands
- ? +/- acres are considered SMZ (limited management)
- ? +/- acres are inoperable (little to no forest management)

Land Management Goals:

It is the objective of the MFC to achieve the following management goals on all Public Lands.

- Sustainable harvest with consistent annual costs and revenues
- Manageable stands of 80-100 acres
- The correct species for the site
- A balanced forest
 - 33 percent of standing timber is reproduction/sub-merchantable
 - 33 percent of standing timber is pulpwood/chip-n-saw
 - 33 percent of standing is sawtimber
- Pine rotation age is 35 years or less for loblolly and 45 years or less for longleaf
- Hardwood rotation age is 70 years or less
- Mixed stand rotation age is 60 years or less

Each property should have a current management plan in place that will be used to establish work goals and set revenue expectations. Our goal is to have 33 percent of the total manageable forested acres available in each product class. Managing many small stands will lead to inefficient micromanagement. This increases the cost of management and increases the time required to conduct management activities. When possible consolidating small stands into one condition reduces

cost and also makes stand more marketable. See MFC standards on maximum timber sale sizes (see page 9).

ANNUAL WORK PLANS, ANNUAL SUMMARY AND ESCROW

As part of the forest management services the MFC provides, each school board will be provided an annual work plan that outlines the accomplishments for the previous fiscal year. This report should be delivered to the school board by the end of July. There is an MFC Annual Report in Excel format that has been created which ensures that we are supplying all the required information. The report will provide a detailed summary of all the work scheduled and completed for that ownership. This will include activities such as harvesting, planting, site prep, road and boundary line maintenance etc. Also included will be all costs incurred and all revenues made. This data can be found by examining all bills submitted to the school board along with any information held at the school board itself, for example, the purchase of gates, culverts, paint and flagging.

In addition to the annual summary, the MFC will also submit a detailed work plan for the next fiscal year. This report will include recommendations such as timber sales, tree planting, burning, etc. Maps may be included as references to the actual sections and their management plans. This should include total planned cost and total expected revenue included for the entire fiscal year. The managing MFC forester will need to obtain an Authorization for Services (AFS) from each school board. The signed AFS will give the MFC permission to start/complete the activities listed in the detail work plan

Escrow is an account managed by the school board; the funds are generated based on timber sales for that school board. State statute requires that 15 percent of the revenue from every timber sale will be placed into this account to be used for forest management (see Appendix C). Although the school board manages this account, it is wise for the MFC to monitor and communicate with the school board to ensure proper funding is available to sustain forest management activities. As practices are recommended and sales made, the MFC should keep in mind the financial status of the escrow account.

EXAMINING FOREST MANAGEMENT GOALS

In addition to simple financial projections of annual cost and revenue, there are two basic tests to see if a forest manager is working towards the MFC land management goals in their management areas.

Test 1: Age Class Distribution, Stand Size and Rotation Length

This test is used to see if the forest manager is meeting the goals of age class distribution, stand size and rotation length. If a forester is in charge of "X" acres of manageable forested land, they must determine how many acres of pine, mixed and hardwood forests are in each type. These numbers should then be applied to our target rotation ages, and this will yield how many acres of final harvest of each type should be planned each year.

For example: A forester is in charge of 10,000 manageable forested acres. 8,000 of those acres are pine, 1,000 acres are mixed and 1,000 acres are hardwood stands.

8000 acres/35 year rotation = 228 pine acres	(@45 Years = 178 ac.)
1000 acres/65 year rotation = 15 hardwood acres	(@80 Years = 12 ac.)
1000 acres/45 year rotation = 22 mixed acres	(@60 Years = 17 ac.)

Therefore, on average, the manager should be conducting a final harvest on about 207-265 acres each year. A key consideration here is how many acres are manageable, inoperable or SMZs. See Appendix A for definitions.

These numbers should be used when examining forest management plans and cutting schedules to verify that the plans and the manager are indeed working towards the MFC land management goals for age class distribution, stand size, rotation length and consistent and sustainable revenues.

This analysis does not include thinning sales, but is only a measure of rotation length and final harvest frequency. Thinnings should be done as needed throughout the life of the stand and should be staggered to make an even annual work load when and where possible.

Test 2: Consistent and Sustainable Cost and Revenues

Test 2 is used to determine if the goal of consistent and sustainable revenues will be met. Consistent and sustainable costs are evaluated as product of escrow availability. If planned costs are above the annual revenue to escrow accounts, there should be a district review of the plans to examine alternate methods or alternate revenue sources from the BOE to get the work done.

For example: A Forester averages \$400,000 dollars in timber sales each fiscal year. This means \$60,000 is available for forest management activities each year. He has \$75,000 in annual forest management costs throughout the life of the plan. In this case a district review will occur. Activities will be prioritized and adjustments made to the plan and/or a request for additional funding will be made to account for these financial limitations.

If escrow accumulates over time, the school board can request of the State Forester to have some of those funds returned to their general budget. If this is requested of the local forester, he/she will need to review the plan to determine the amount than can be returned without compromising needed forest management activities.

SCHOOL TRUST LANDS CLASSIFICATIONS

Land Classification

School Trust lands are classified into eight (8) categories: (1) forest land; (2) agricultural land; (3) industrial land; (4) commercial land; (5) farm-residential land; (6) residential land; (7) recreational land; and (8) other land. The classifications shall be applied to said lands based upon the finding of the highest and best use of each parcel or tract for producing a maximum of revenue by proper utilization. School Boards make these classifications.

Historically Residential Leases created the possibility for conflict between forest management and lease holders. As a result not all farm residential leases can be effectively managed for timber production. In some cases due to lease factors it may not be efficient to spend time trying to harvest or otherwise manage some of these leases (designated inoperable due to lease issues). This final decision should be approved by the Public Lands Assistant District Forester (ADF) and changes made to the forest management plan.

- The MFC is responsible for managing all forested acres on these lands

- The MFC does not manage lease holders; this is a school board issue. The MFC serves only as a technical agent with a primary role to advise on forestry management. Conflicts with lease holders over forest management activities should be communicated to the school board
- In the event of a conflict, communications between the MFC and school board will be key to seeking a final solution. Prior communications with the school board on recommended activities in these sensitive areas is the best approach
- Planned activities should be communicated annually to the BOE and the lease holders
 - In addition, management plans should be available online for viewing
- If a question arises about timber harvesting on a particular lease, check the lease agreement
- If there are harvest/reforestation limitations, consult with Public Lands ADF as to the recommendation to present to the school board
- Lessee has the responsibility to protect the forested acres from fire and cattle
- When harvesting, be sure to mark clearly and take pictures of all fences, gates and other structures near or within the harvest area before the sale
 - Never assume an old fence is no longer in use
 - Property should not be altered or destroyed
- For additional information, see the “Public Lands Statutes” in the Appendix C

Hunting Lease Issues on Public Lands

- The school board should inform hunting lease holders of planned cutting and management activities annually. The MFC can supply the leaseholder a copy of the current plan for the section in question or they can be directed to the Secretary of State website:
<http://www.sos.state.ms.us/publiclands/16th/forestmgt.asp>
- Although management of forests should not be hindered by hunting leases, sensitivity can be used when planning and implementing activities in these areas
- Care should be taken in high use hunting areas not to inventory or have bid openings during peak deer hunting times (safety issue)
 - Keep the buyers out of the woods from Christmas through first week of January.
- Keep food plots and trails open and free of logging debris when logging

STAND CONSIDERATIONS ON ALL PUBLIC LANDS

Pine Stands

The definition of a pine stand is a stand of trees that contains > 75% of the Basal Area (BA) in pine.

- Pine stands will be managed on a 35 year rotation for loblolly and 45 years for longleaf
- Thinning is generally done to a BA of 75 (+/- 5) but site index can affect the desired target
- Pine plantation thinnings guidelines:
 - First thinning generally between the ages of 14-16
 - Second thinning generally between ages 20-21
 - Third thinning (if planned) generally between ages 26-27
 - Final harvest at approximately age 35.
- Several factors will have to be considered such as site index, stocking, species and stem quality

Hardwood Stands

The definition of a hardwood stand is when the pine component is < 25% of the BA of standing trees.

- As a general rule for hardwoods, the MFC will managed on a 75 year rotation, on high site index rotation age may be reduced to age 65
- The MFC will manage for the best commercial species and products for the soil type/site
- All hardwood management decisions will be evaluated through the district office prior to any on the ground actions. Any bottomland hardwood sites scheduled for regeneration cuts must be approved by the District Forester (DF)
- Various thinning methods may be required depending on site, species and stand condition
- Regeneration methods may include natural or artificial regeneration – several factors will affect which method is required such as site conditions, existing species, flood patterns and escrow management

Mixed Stands

The definition of a mixed stand is when the pine component is between 25% - 75% of the BA of standing trees. These stands typically occur in high site index areas.

- The MFC will manage these stands on a 45-60 year or less rotation
- These stands will require more attention (TSI, selective harvest) to achieve the right species composition for the final crop

INDIVIDUAL MANAGEMENT ACTIVITIES

MAIN LOGGING ROAD CONSTRUCTION AND MAINTENANCE

- All interior wood roads should meet Mississippi Best Management Practices (BMP) standards
- To establish a main road, it should be at least 25 feet wide, using 30 foot culverts where needed
- From a wildlife management standpoint, road edges that are kept in native grasses and shrubs bordering a stand of trees are great habitat for deer and turkey when properly maintained
- Fire control and prescribed burning will be easier on these wider roads because the road will provide a firebreak or anchor point if needed
- Sides of roads should be sloped and planted to help minimize erosion potential
- There should be some crown to the new road and turnouts placed where appropriate
- Roads should be seeded as soon as they are finished to avoid excess runoff
- Surfaces should be kept in grass where possible for easier maintenance
- Gravel may be used on steep slopes or wet areas, but proper road construction can help minimize the need for gravel

GATE PLACEMENT AND CONSTRUCTION

Gates need to be installed on public lands properties at all major entrances. Gates must be sturdy and able to accept two different locks (one for MFC, one for lessee). It is recommended that all locks to all gates on the sections in a county be keyed the same. Gates should be at least 14' wide to allow easy access for logging trucks. If possible gates need to be 50+ feet off the main road to allow for parking and safe ingress and egress. Gates should be installed properly, painted a bright color (and/or highly

visible reflective tape used) and should be maintained by the MFC. Using cables across roads is not acceptable or approved for safety reasons. If any exist, they should be replaced immediately.

PROPERTY BOUNDARY LINES

Maintaining property lines helps prevent disputes of trespass, timber theft and eliminates future surveying costs. Section lines that affect timber management activities need to be defined/surveyed. The school board pays for surveys and the maintenance of these lines. The MFC is responsible for maintaining the lines by painting. Firelanes may be used as an additional measure but are not required or possible on all on boundary lines. Firelanes adds access benefits for management activities.

To correctly mark a public lands property boundary line, the following standards have been adopted.

- The approved MFC boundary line color is **orange**. It should not be used on any interior line, stand or other markings.
- All painted property lines will be maintained on a maximum 5-year rotation
- Paint 20-25 percent of all lines every year
- Paint should be applied on intervals of at least 60 feet (20 yards) or less
- Paint should be placed 4-6' above the ground at approximately eye level
- "Hacking" or "scraping" of the bark when marking trees should be done before application of the paint
- Remove only the outer bark, taking care not to expose the cambium
- A thick coat of boundary line paint should be applied as an 8"-12" dot or line on the tree or fencepost
- If there are no trees available, T-posts should be used
- If lines are maintained by an adjoining landowner, we will still mark and maintain our line, but do not mark overtop their lines
- If a tree is located exactly on the line, two marks should be placed on opposite sides of the tree corresponding to the boundary line (through the boundary line itself).

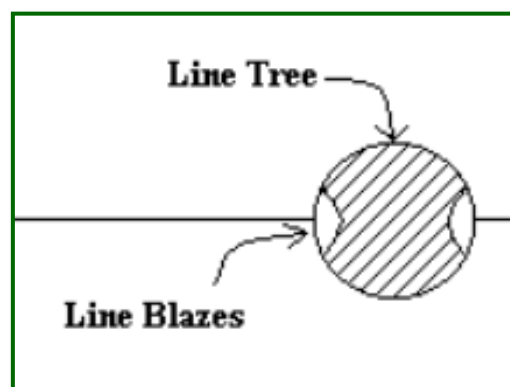


Figure 1: Paint on two sides of the tree if it is on the line

- If a tree is slightly off the line (within three (3) feet) place one (1) mark facing the line

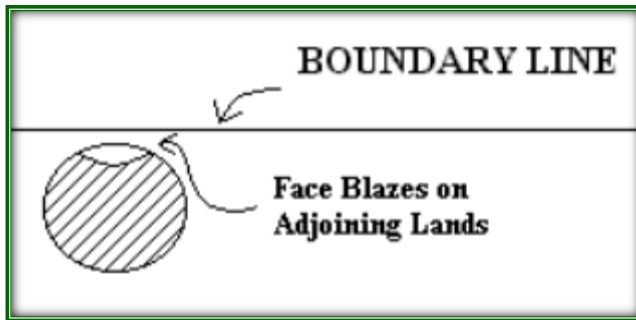


Figure 2: Paint faces toward the boundary line.

- When corners are located, three (3) horizontal marks are placed on the corner tree (if present) with the paint facing the corner

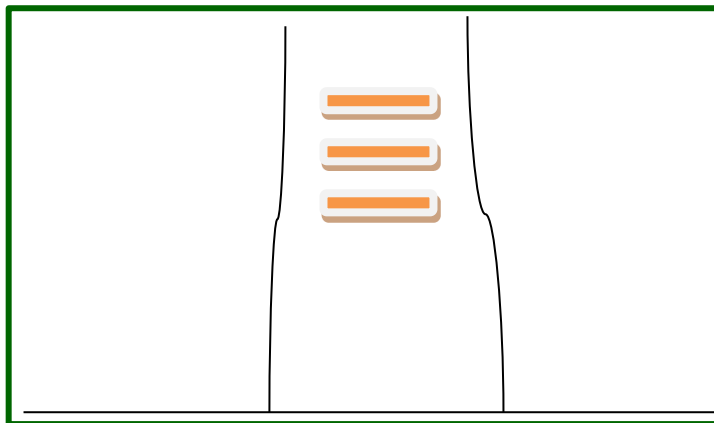


Figure 3: Three horizontal marks are placed on corner tree when present.

TREE PLANTING STANDARDS ON ALL PUBLIC LANDS

Loblolly Pine Planting

- When available and financially feasible, the MFC will choose to plant genetically improved, containerized pine seedlings on pine sites (for sawtimber production)
- For sawtimber production, a minimum of 500 Trees Per Acre (TPA) correctly planted is required
- Survival on public lands should be greater than 350 TPA the first fall, if it is not the stand should be inter-planted the following planting season

Loblolly Pine Natural Regeneration

- Natural regeneration is not the preferred method of regeneration
- The goal is to have 500-700 pine TPA evenly dispersed over the stand
- The seed tree method of leaving 10-12 mature, evenly spaced, high quality seed producing trees per acre is encouraged
- The site should be burned beneath the seed trees to promote seed to soil contact and germination. The seed trees should be harvested within 2-3 years of establishing a new pine stand

- The site should also be checked at this time for pre-commercial thinning needs

Hardwood Plantings

- Planting of seedlings can be used as a supplement to increase the component of the desired species in a clear-cut situation or to establish new stands in converted agricultural fields
- When supplemental planting a previously forested site, our target will be 436 TPA of commercially desirable species
- A blend of species is needed so as to provide trainer trees for the desired final crop trees.
- For sawtimber production in converted areas, a minimum of 436 TPA commercially desirable species correctly planted is required
- Plantings in converted areas should be composed of species that are correct for the soils and site

Hardwood Natural Regeneration

- Natural regeneration methods such as seed tree or shelterwood should be used when stand conditions allow for adequate regeneration of the desired species
- The regeneration period is complete when you have approximately 500-600 TPA of the desired species as advanced regeneration
- “Advanced regeneration” means seedlings are at least 2.5 feet tall
- The final crop trees are generally removed within 5-7 years of the initial cut

CHECKING PLANTING AND SURVIVAL

Tree planting on public lands must be inspected during planting and several months later for survival. Planting inspections made during planting include a site visit to check seedling quality, care and that the planting is going well (spacing is good and trees planted correctly).

A compliance check is when trees are checked directly after the planting job has been finished. This is done to ensure the entire tract meets specified planting requirements.

A survival check is done at the end of fall to get an accurate count of the trees that survived. This number is used to determine if re-planting is necessary and for future management decisions based on TPA numbers.

- Pines will be checked for planting compliance and survival using 1/100th acre plots with a radius of 11' 9"
- Hardwoods will be checked for compliance and survival using 1/20th acre plots with a radius of 26' 4"
- One plot per two acres will be taken up to 15 plots for any given tract
- If a tract fails, double the number of plots to ensure that the tract has failed. Then you may proceed with contacting the tree planter to correct the situation
- Forms and instructions for conducting these checks are on the MFC website

TIMBER SALES

In addition to the guidelines here, state statute regarding timber sales on public lands can be examined in the Appendix C.

OVERALL GOALS

- Maximize revenue
- Maintain sustainability
- Manage the right species with the right site
- Protect and manage for multiple use
- Protect wildlife habitat

STANDARDS FOR DETERMINING TIMBER HARVEST SIZE

Listed below are MFC accepted standards for determining timber harvest size on School Trust Lands and Other Public Lands

- Maximum size for thinnings has been set at 120 acres. The maximum sale size for regeneration sales has been set at 110 acres
- Sale size for initial (1st) thinnings may exceed 120 acres if the proposed sale consists of the entire strata
- Intermediate thinnings, 2nd and 3rd thinnings, which exceed 120 acres, will be divided into smaller sale sizes
- Regeneration sales that exceed 110 acres in size will require District Forester approval
- All sales that exceed these established limits must have the District Forester's approval. The DF will notify the State Forester and Assistant State Forester of these sales

CONDUCTION A TIMBER SALE

The following sections generally follow the order of application (the order in which a timber sale should be conducted).

Examine the Plan

Before the fiscal year begins, each forester should examine the planned harvests and review the recommendations being made. Any major changes to sales including type of sale, change of acreage, addition or deletion of management activities, etc, will be changed in the GIS system. These changes will be approved by the ADF and forwarded by email to the Management Chief. This should be done prior to the annual work plan submission to the BOE.

Getting the AFS

An AFS must be signed prior to doing any work. This includes all work conducted on public lands. This is typically done once a year in July at the beginning of the new fiscal year. All planned activities are submitted at one time for approval. The AFS forms can be found on the MFC website or obtained from the District Office (DO). The proposed ASF form will be approved by the DO before submission to the school board. This is also a good time to start a Timber Sale Workbook (TSW) and the Timber Sale File for each planned sale.

Timber Sale Boundary Lines

Boundary lines that cannot be easily distinguished from imagery should be recorded with a GPS (especially SMZ boundaries). The following standards for paint and flagging of a timber sale have been adopted:

- Both flagging and paint must be applied in such a manner as to be easily seen by a person in a cutter
 - It is recommended that paint and/or flagging be placed at eye level at least every 30 feet (10 yards)
- If a sale boundary is adjacent to other merchantable timber, the sale boundary will be marked with paint that is clearly visible at both eye level and at the stump
 - If flagging is used in addition to paint, they must both be the same color
- If a sale boundary is along a fence, open ground, sub-merchantable timber, road or other easily distinguished line, only flagging is required
- Any SMZ should be painted and flagged in a color different from the sale boundary, property boundary or any other marked trees
 - SMZ lines should be easily distinguished
 - SMZ boundary trees will be painted on both the tree and the stump
 - SMZ sizes will adhere to the Mississippi BMP Manual

Although there is no statewide standard for colors marking a timber sale area boundary, the following colors are recommended:

- High visibility **Red** flagging/paint for a sale boundary
- High visibility **Yellow** flagging paint for SMZ boundary
- **Blue** flagging/paint for marking trees either cut or leave

High visibility colors should be used as some “standard” colors (particularly yellow) are difficult to see in many forest settings.

The Timber Sale Map

At a minimum, timber sale maps should include the following:

- Name of the Section and/or school board Name
- The Section-Township-Range location of the sale
- The fiscal year of the sale and how the boundaries are marked
- The sale acres - Type of Sale (Thin or Final)
- Any SMZ in the sale area
- Roads and main skid trails
- Pre-determined logging decks
- Locations of any gates/culverts/creek crossings
- Forester Contact Information
- Gate Combination
- Scale Bar
- North Arrow
- Legend if needed

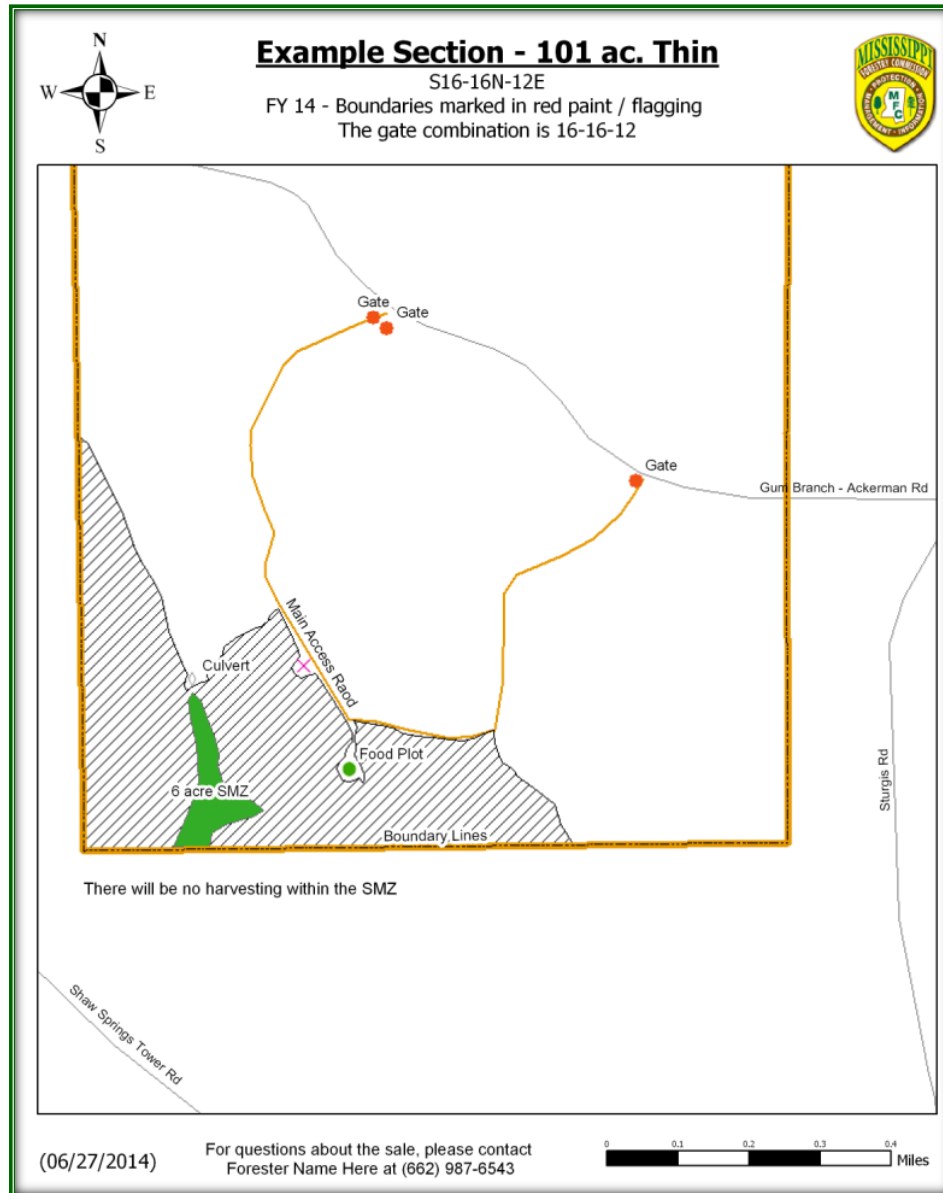


Figure 4: Timber Sale Map

Setting Up The Cruise

Cruise Requirements

The following are the required cruising specifications for all Public land sales:

- Every cruise for a timber sale will have at least 10 fixed area plots
 - The exception is a 100 percent Tally Sale or an emergency sale
 - No point (prism) cruising figures are allowed for timber sales purposes including post-harvest cruise
- Every sale will meet the minimum of +/- 10 percent of the total tons per acre at the 90 percent confidence level (value obtained from T-Cruise reports)

Maximum Limits For Cruising

- Lump Sum maximum limit is a 10 percent cruise (sample no more than 10% of the acres)

- Therefore, if you have cruised a lump sum sale to 10 percent of the total acres and still not reached goal #2 above, one may stop
- PAC sale maximum is a 2.5 percent cruise (2.5 percent of the total acres)
 - Therefore, if you have cruised a PAC sale to 2.5 percent of the total acres and still not reached goal #2 above, one may stop

In addition to these statewide maximum percent levels, the DO may choose to cruise to a higher maximum percent if deemed necessary in certain cases (such as shelterwood or hardwood thinning).

How Many Plots Should I Start With?

There is software available called the Plot Estimator which uses an average Diameter at Breast Height (DBH) of the stand and an average TPA (variability estimates can be used in the software version) to estimate how many plots will be required for the cruise. This gives a manager a starting point as to how much time and effort the cruising portion of the sale will take.

The following chart is taken from calculations made with the Plot Estimator. The numbers below are an initial estimate of the plots that will be required.

Table 1: Initial Estimate Of Plots Needed					
DBH	TPA				
	75	150	225	300	450
6	173	96	61	41	20
7	148	77	47	29	12
8	128	63	35	21	10
9	111	51	27	14	
10	97	42	20	10	
11	85	34	15		
12	75	28	11		
13	66	23	10		
14	58	18			
15	52	15			
16	46	12			
17	41	10			
18	36				
19	32				
20	28				

Plot Layout On Timber Sales

Random plot placement can be used when stands have been properly stratified and variability within the stand is low. Stratified random sampling is useful and effective only when you have a homogenous stand. Properly stratified (or homogenous) stands within the MFC mean that trees are grouped together and *have similar TPA, DBH, heights, species composition and age*. Stratified random sampling allows for fewer plots in stands with low variability (tons per acre).

When to use random plots?

- The stand is stratified correctly and the stand has even aged, evenly distributed trees (low variability)
- Pine thinnings and any plantations with even stocking

A stratified grid is useful when stands are fairly consistent in species distribution, TPA and DBH. Grid sampling on an MFC timber sale operates on the principal that each plot represents a percent of the total stand, that the stand as a whole is similar, and that by sampling at a specified distance across the entire stand, localized variability has been accounted for. This method can account for most minor changes in stand density when implemented correctly and will generally require fewer plots than a basic grid design.

When it is acceptable to use a stratified grid?

- Topography or other factors influence stocking densities, but age, size and species are fairly consistent across the stand (multiple aged stands or even aged natural stands – stands with average variability)
- Pine, mixed or hardwood sales where individual species or products may have significant impacts on the value of the sale

In either of the stratified plot designs, each stand must be treated separately and cruised independently. Multiple cruise reports can be combined at the actual time of sale, but for cruising, each stand should meet statistical goals or maximum cruise percent limits individually.

Plot placement using a basic grid design is applicable when a sample must be taken over several different stand types of smaller acreages at one time, when acreage determinations of specific stand types is not prudent or when stratification is impossible. This system operates on the principle that each plot represents a percent of the sale area and that each area gets equal representation. This is generally a 10 percent cruise. The use of the basic grid system across multiple stand types generally requires more plots than stratified sampling.

When to use a basic grid?

- Topography changes or other factors significantly influence species, stocking densities, tree size and variability in a stand (highly variable)
- The sale covers multiple, smaller acreage stand types

After deciding on the number of initial plots needed, and determining how to layout the plots, the Plot Allocator can be used to create files for navigating to the plots (the waypoint file). This file, along with any needed shapefiles can then be used on a handheld device for navigation and plot data collection. Detailed instructions on these processes are on the MFC website and are covered in training classes held by the MFC.

- Post-cruising plots should either be the same plots used for the pre-cruise or allocated in the same manner as the pre-cruise (grid or random)
- If you need help in deciding which type of layout to use, contact your DO

Conducting The Cruise

Recommendations for Choosing the Right T-Cruise Template

- For a first thin pine, template #9 (1/20th acre total height)
- For a second thin or final harvest, template #6 or template #8 which are 1/10th acre and either total or merchantable height
- For cut-leave sales, template #2 in Hardwood bottomlands or template #12 in pine stands
- For Final Harvest Bottomland Hardwoods, template #3

The key factor in choosing the proper template resides in one major area, TPA. The goal of choosing a plot size is to sample 15-20 trees per plot. This will speed up the time it takes to do each plot, encourage total stand representation and reduce the likelihood of missing or double counting trees. When plot sizes are too large, the TPA count can reach 40 or more trees, which can significantly slow down a cruise and possibly misrepresent a tract. In most cases, smaller plot sizes (sampling 15-20 trees); with more plots will be more representative of a stand than fewer plots of a larger size.

Example: One needs to sample an 80 acre natural stand of pine for a first thin. 30 - 1/20th acre plots scattered throughout a tract will better represent the stand than 10 - 1/10th acre plots will.

Other than TPA, total height or merchantable height is the only other real factor. If all the trees are basically the same height (an even aged pine stand), then there is no reason not to use a total height template. It is faster and more accurate when calling heights if you know that they are all about the same. T-Cruise will estimate the merchantable height of each tree based on the diameters and total heights recorded.

Approved MFC templates may not be modified or altered in any way without the approval from the Forest Management Chief or State Forester.

Plot Protocol

County Crew Responsibilities

- Crews will flag plot center with some form of flagging and also place flagging on a nearby tree
- The flagging should have the Plot ID number written on it with permanent marker
- Once any cruise is completed, the .tcd file shall be sent to the DO
- The waypoint file from the RECON or NOMAD and a map should be sent to the DO

Moving Or Forcing A Plot

If stand boundaries are done properly, there should be no need to move a plot. *If the acreage and the area where the "bad" plot falls will be taken out of the sale, you do not need to take the plot.* However, trails, cut rows, briar patches and other "anomalies" all occur within a stand. When you move an existing plot, you bias your sample. If there 100 acres mapped out, there will be cut rows and trails going throughout the stand. If you move a plot to a better looking spot, you are inherently increasing the volume estimate of that stand from what it really is. These bare areas are out there and they are in the sale area. In other words, if it is in the sale area, take the original plot.

If it is determined while in the field that a plot should be moved due to bad mapping, standing water or due to some other unforeseen reason, the standard shall be to move 1 chain north from the original

plot and force a plot. If north is not possible, go east (and so-on in a clockwise direction until a suitable plot location is possible).

Knowing Your Products - A Basic Guide

Specifications for products are listed in each contract. The following are the specifications to which we generally cruise, unless otherwise specified in the contract.

- What is a pulpwood (PW) tree?
 - DBH is 4.6" or >
 - There is at least 40' in total height (30' to a 3" top)
- What is a Chip-n-saw (CNS) tree?
 - Pine species that is 8.6" to 11.6" DBH
 - Within the first 18' from ground level it is straight, with no sweep, large knots, swollen spots or cat faces
 - No more than 1 or 2 small limbs on the first 18' of the trunk
 - This is small sawtimber
- What is a Pallet (Pallet) Tree?
 - Hardwood tree 11.6" to 15.6" DBH
 - This is small sawtimber
 - Very few or no limbs in the first 18' from ground level
 - Straight, not hollow or with a swollen spot in the first 18' from ground level
- What is a Sawtimber (ST) Tree?
 - Pine DBH > 11.6"
 - Hardwood DBH > 13.6"
 - Very few or no limbs in the first 18' from ground level
 - Straight, not hollow or with a swollen spot in the first 18' from ground level

We recognize that there are several categories of poles. These products will be capitalized on as markets present themselves.

Product Diameter Limits In T-Cruise

As of this printing the following product limits are set in T-Cruise (this is what T-Cruise will allow without denoting an error):

- Pine:
 - PW = 4.6" to a 3" top
 - CNS = 8.6" to a 6" top
 - PST = 11.6" to a 8" top
 - Pole = 9.6" to a 6" top
- Hardwood:
 - PW = 4.6" to a 4" top
 - Pallet = 11.6" to a 10" top
 - ST = 11.6" to a 10" top

These are the minimums set in the templates. They may not be the minimum DBH you use in your area depending on mill specs and buyer preferences, but they are the smallest diameters that T-Cruise will accept for the product type. Top diameters cannot be changed.

For example:

- If you attempt to enter a 4.5" pine as PW, you will get an error
- If you attempt to enter a 4.6" pine as PW, that is ok, it will take it
- If you attempt to enter a 11.5" pine as ST, you will get an error
- If you attempt to enter a 11.6" pine as ST, that is ok, it will take it

The First Day In The Field

Crews should start the first day in the field by sampling 20-30 plots, or a full day worth of sampling. These plots should be spaced out over the entire tract to gain a good representation of the total tract. The plots will then be run through T-Cruise to see the statistical output from the data that was collected.

Check the statistics tab and see if your 10% error was met at the 90% confidence level. This number should be < or = 10%.

Statistics Tab

Non-Stratified								
T Value: 1.709								
Total Volume Stats:	90% CI	Plots Needed to be +/- 10%	Mean/Acre	Tons	Variance	Std. Dev.	Std. Error	CV
Hardwood	8.5%	19	77.5	417.4	20.4	3.874	26.4	

This indicated the total number of plots needed to achieve 10% error level or less.

If the percent does not meet the requirements, this number here is the estimated number of total plots needed to achieve a 10% level (*this is not how many more plots are needed, but how many plots are needed in total*).

This number (along with the CV) will vary depending on the variability of tonnage per acre within the stand.

Validating T-Cruise Reports Before Selling

First it must be said that just because T-Cruise looks correct (believable), that it does not always catch every problem.

- The first thing that should be done on a cruise is to make sure to check the .tcd for blank plots and delete them (unless they are intentional). This is done under "Edit Plot" and scrolling through the plots one at a time to make sure none are blank
- When you run the report, make sure that your statistical goals have been met. Either your error must be below 10 percent, or you must have met maximum cruise percent limits. You can calculate percent cruised using the # of plots x the plot size, then divide that # by your acres

Example:

37 plots x .2 acre plot size = 7.4 acres sampled

If I have a 74 acre stand then I have a = 10% cruise done.

T Value: 1.689

Total Volume Stats: 90% CI

Hardwood 10.1%

Total Acres: 74

Number of Plots: 37

Cruise Method: Fixed

Plot Size: 0.2

- Most sales have between 80-110 tons per acre total. Anything under 70 or over 120 tons per acre should be questioned. If it is over 140 tons per acre, a review of the sale and possible audit checks should be done

Pine											
Total Tract					Average Acre					Average Tree	
Product	Trees	Tons	Cords	DMBF	BA	Trees	Tons	Cords	DMBF	DBH	MerchHt
Sawtimber	5,741	4,430	1,704	459	25.6	26	20	7.8	2.105	13.2	31.8
Chipsaw	23,471	11,132	4,281	1,079	56.4	108	51	19.6	4.951	9.8	45.2
Pulpwood	65,545	12,741	4,900		71.5	301	58	22.5		6.5	41.7
Topwood		0	0				0	0.0			
Total	94,757	28,303	10,886	1,538	153.6	435	130	49.9	7.056	7.7	41.9

- Normal average tree merch heights are 30 – 50 feet
- Normal BA range of 100 – 160 is expected for an un-thinned stand
- Normal TPA 350-450 for first thin pine plantations...70-175 TPA on a final harvest
- If the total DMBF per acre is over 10,000
- If any of the data above falls outside the normal range, the cruise will be audited/reviewed by an ADF
- If tons per acre is above 150 tons, the cruise will be audited by the ADF

Timber Sale Audits

The purpose of an MFC audit is to audit the cruiser, not the cruise. We are auditing a cruiser's ability to accurately measure tree diameters, heights, identify key tree species, make proper product designations and determine correct number trees per plot. It is to be a tool to ensure accuracy in Public Land timber sales and inventories associated with other Public lands. Audits of timber sales are to be completed prior to the sale being advertised. After the audit is completed and approved, the timber sale may be advertised.

County Crew Responsibilities

- Crews will flag plot center with some form of flagging and also place flagging on a nearby tree
- The flagging should have the Plot ID number written on it with permanent marker
- Once any cruise is completed, the .tcd file shall be sent to the DO
- The waypoint file from the RECON or NOMAD and a map should be sent to the DO

Auditors Responsibilities

- All cruises will be evaluated on a total tons per acre basis
- A minimum of one (1) audit per Service Forester or Technician's management area is to be conducted annually
- Any cruise in excess of 150 tons/acre, will be audited by the ADF
- At least five (5) plots and up to a maximum of 10 plots will be checked during an audit
- Plots will be measured using the same template and methods used on the original cruise
- The audit plots will be run up using T-Cruise and compared to the same plots from the original cruise
 - The tract acres used on the .tcd will be the same as the number of plots when running these comparisons (if you take six (6) plots, use six (6) acres)
- The results of the audit (good and bad) are to be discussed with the county personnel and placed in the timber sale file

Audit Procedures

To conduct the audit, you must know what plots from the original .tcd you have audited. This can be done several ways. Two common ways are as described below

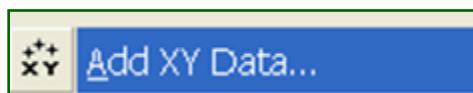
Method #1 – Use the original, blank waypoint file from the original cruise on the audit. Once the plots have been visited, the plot ID numbers from the audit should match the plot ID numbers pulled from the original cruise. Plots which have been forced will not show up on this waypoint file.

Method #2 – Use the shapefile of the visited plots (from the original T-Cruise .tcd) to navigate to the points. Take your audit plots and then match them up with the plot ID from the original .tcd file. This can be done by looking at the attributes in both Arc and T-Cruise.

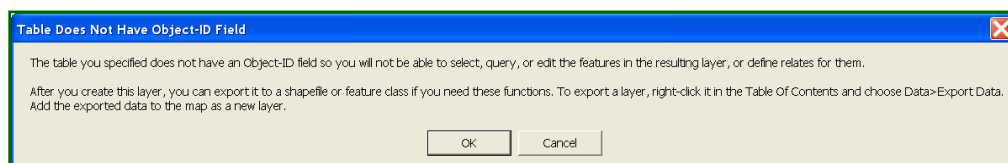
No matter the method used, the plots compared must be the same plots.

HOW TO VIEW VISITED PLOTS IN ARCMAP FROM A .TCD

1. Open T-Cruise and run the "example".tcd by group, close T-Cruise
2. Open ArcMap. Click the Tools menu. Choose Add XY Data

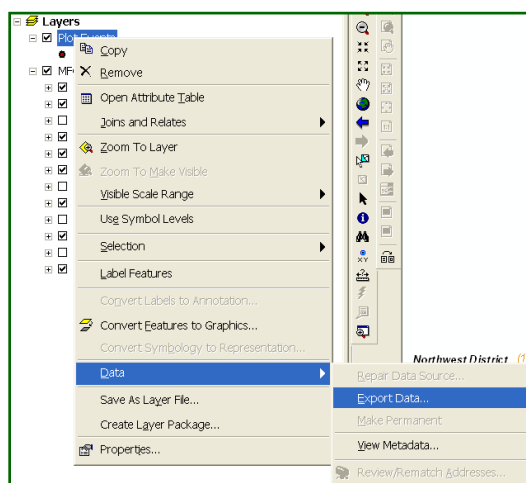


3. Browse to the location of the "example".mdb. (should be in the same location as the "example".tcd) and add the "Plot" table
4. Click "Edit" at the lower right corner to edit your Coordinate System, select Geographic Coordinate System. Open World and select WGS 1984.prj. Click Add
5. If prompted, click OK on the Spatial Reference Properties window, OK on the Add XY Data window, and OK on the warning page



6. You should now see your data on the Map View and the table as an event in your TOC.

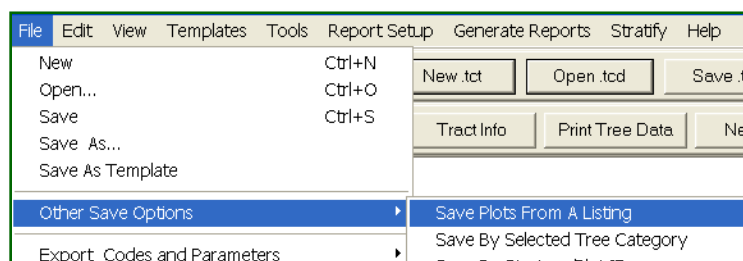
7. Right click on the Plot Event Table, Data, Export Data



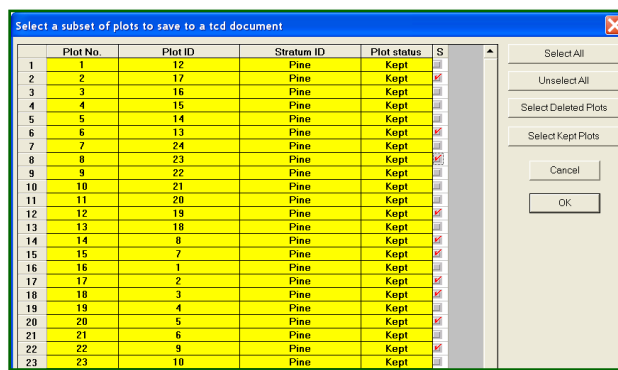
8. Name the file and save to a location of your choice. You have now created a shapefile of the visited plots and can view the attributes (such as plot ID #)

How To Separate Plots From A Cruise To Compare To An Audit

1. In T-Cruise, open the .tcd for the cruise you want to audit
2. Make a list of the plots taken in the audit cruise
 - a. Ex. – plots 2, 3, 5, 7, 8, 9, 13, 17, 19, and 23 were cruised in the audit. These will be the PlotID numbers, not the Plot No. The plot ID number for a specific location can be found using the ArcMap and the procedure above
3. Click on the File menu | Other Save Options | Save Plots From A Listing



4. In the window, click the grey square under the “S” column that corresponds with the Plot ID you wish to select. A red check mark will appear for your selections



5. Click OK. This will open a Subset Save dialog box. Name the file appropriately (don't forget to add the .tcd at the end of the file name) and click Save. You have now created a new and separate .tcd file

6. Open this new subset .tcd. Adjust the acres to represent the area cruised (acres should = # of plots being audited) and run by group
7. Print the same reports (#1) for both the original cruise and the audit cruises and compare
8. If an audit fails and plot level information is needed, you can compare the trees tallied for both the audit cruise and the subset of the original. Use the Print Tree Data button on each .tcd (original and the audit) and save to file (MS Excel is the easiest format to manipulate). You can then compare the plot data side by side if needed

Auditing Standards

The following auditing standards must be met in all audits.

- The original cruise estimate of the tons per acre must be within +/- 10% of the audit cruise numbers. See example below
-
- Merchandising must fall within an acceptable range of no greater difference than 10 tons per acre within the CNS and/or ST classes. See example below

Example - The audit shows 112 tons per acre, the original must be between 101 and 123 tons per acre (112 +/- 10%). The audit shows 89 tons per acre of pine CNS, the original pine CNS must be between 79 and 99 tons per acre.

Pine											
Total Tract					Average Acre					Average Tree	
Product	Trees	Tons	Cords	DMBF	BA	Trees	Tons	Cords	DMBF	DBH	MerchHt
Submerch	393	0	0		1.0	9	0	0.0		4.5	11.0
Chipnsaw	4,809	3,903	1,501	372	86.4	109	89	34.1	8.452	11.9	56.4
Pulpwood	2,829	1,018	391		26.1	64	23	8.9		8.5	43.9
Topwood		0	0				0	0.0			
Total	8,030	4,921	1,893	372	113.5	182	112	43.0	8.452	10.4	49.3
Grand Total	8,030			372	113.5	182			8.452	10.4	49.3

- If the cruise does not meet these requirements, the sale will be re-cruised
- If cruise results meet the standards, the timber sale proceeds to next stage. When a crew fails an audit, another audit should be scheduled for the next sale done in their area
- Using this report, an auditor can also compare and determine where the differences are coming from. It may be tree count differences, diameter or height inconsistencies

Pine											
Total Tract					Average Acre					Average Tree	
Product	Trees	Tons	Cords	DMBF	BA	Trees	Tons	Cords	DMBF	DBH	MerchHt
Submerch	393	0	0		1.0	9	0	0.0		4.5	11.0
Chipnsaw	4,809	3,903	1,501	372	86.4	109	89	34.1	8.452	11.9	56.4
Pulpwood	2,829	1,018	391		26.1	64	23	8.9		8.5	43.9
Topwood		0	0				0	0.0			
Total	8,030	4,921	1,893	372	113.5	182	112	43.0	8.452	10.4	49.3
Grand Total	8,030			372	113.5	182			8.452	10.4	49.3

The Advertisement, Prospectus, Bid Opening And Contract

The required advertisement is a newspaper ad that gives a general description of what is for sale, when the bid opening is and where the timber is located. It contains contact information for the BOE representative or MFC contact for gathering additional information on the sale (a prospectus).

The prospectus is an unsigned copy of the contract. This is sent to known potential buyers in an area and to those who specifically request it. The contract specifies all duties and expectations of both the buyer and seller. Other information such as how boundaries are marked, the products for sale and other information regarding the specifics of the sale are contained here.

The bid opening normally occurs prior to a scheduled BOE monthly meeting, but must occur within 7 days of the last published advertisement. ***Care should be taken not to schedule bid openings the week of Christmas through the week following New Year's Day.*** Specific procedures of the BOE may differ slightly but the main process is the same. Sealed bids (faxed bids not allowed) are opened at the time and location specified by the prospectus. Each bid is opened and recorded for each sale. This is normally done in the presence of both an MFC representative and a BOE representative. The winning bid and a copy of all bids are brought to the next BOE meeting and bids are either accepted or rejected. The MFC will provide a minimum bid price recommendation for each sale in writing prior to the BOE meeting.

According to state statute, a sale must be advertised a total of four (4) consecutive weeks and the bid opening must occur within seven (7) days of the last advertisement.

After acceptance of a winning bid, the BOE will notify the winner in writing within 10 days. It is recommended that the MFC also notify the winning bidder as a courtesy and to keep lines of communication open. The winning bidder on a tract must sign the prospectus within 30 days of being notified (or as specified in the contract), or will forfeit the bid. This signed prospectus will become the contract for the remainder of the sale.

Along with the signed contract, all deposits, securities or payments must be made within this 30 day period.

Basic Prospectus/Contract Contents

There are five (5) approved MFC timber sale contracts.

- First Thin Pay-as-Cut
- Second Thin Pay-as-Cut
- Final Harvest Pay-as-Cut
- Final Harvest Lump Sum
- Salvage Sale

Official and approved copies can be found on the MFC website. The basic content of the contracts is the same for all (and will not be edited), with fill-in-the-blank areas for specific information pertinent to a particular sale.

The basic content includes:

- Information on what products are for sale

- Information on the location of the timber (including map)
- Information regarding dates and locations for bid openings
- Contract length and performance bond requirements
- How the sale and boundaries are marked
- What is expected of the buyer
- What is expected of the seller
- All legal requirements

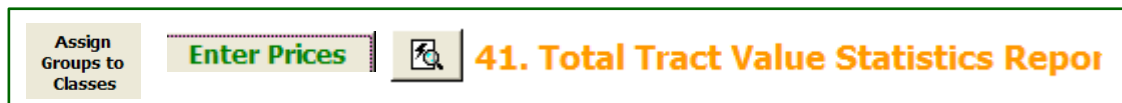
Performance Bond Limits For School Trust Lands And Other Public Lands Timber Sales

- The performance bond on lump sum sales is set at 10% of estimated sale value but not to exceed \$10,000
- The performance bond limit on 1st thinnings over 40 acres in size, is set at \$5,000
- The performance bond limit on 1st thinnings under 40 acres in size, is set at \$1,500
- The performance bond limit on 2nd thinnings is set at \$7,500

Setting The Minimum Bid For Lump Sum Sales

It is important to remember that the minimum bid is the lowest acceptable price that the MFC would recommend accepting (not the price we would ideally want to get). When setting prices, one should use a current average price for the products or the lowest price one is willing to accept. The MFC has access to Forest 2 Market and should use this as a guide when setting minimum prices for products.

Although the MFC guidelines for a sale are to meet the statistical goal of +/- 10% of the total tonnage, this does not translate into the same error for stand value. To see what the expected value of a stand is, you must enter T-Cruise Reports for the particular sale, “assign groups to classes” then “enter prices” for each product and then run report #41. Using the % error and value, compute the minimum expected value (bid).



Example From A Real Sale Of 40 Acres Of Pine Sawtimber:

- First, the tonnage statistics report #40 was run. Notice the tonnage requirements were met at the 9.9% level for this sale with 27 plots. One can deduce that the actual tonnage per acre is 118.6 (+/- 9.9%)

<i>All Products</i>						
90% CI	Plots Needed to be +/- 10%	Mean/Acre Tons	Variance	Std. Dev.	Std. Error	CV
9.9%	27	118.6	1,426.4	37.8	6.883	31.9

- Once groups were assigned and prices were entered, the value report #41 shows the following

<i>Total Tract</i>		
90% CI	Plots Needed to be +/- 10%	Total Tract Value
13.5	47	\$93,205

- Reading this, one can come to the conclusion that the actual value of the stand is \$93,205 (+/- 13.5%)
- Using simple math ($93,205 - 13.5\%$), the minimum bid should be set at \$80,622
- In order to reach a +/-10% confidence level *on price*, T-Cruise is estimating that 47 plots should be taken (as opposed to the 27 for tonnage)

Timber Sale Price Report

This report is submitted immediately after all bids are opened for a sale. The data entered into this report includes (but is not limited) to the acres in the sale, the products being sold, the volumes of each product type, the value received for each product type, who the bidders were and their bids. Information from this report is used outside the agency (data forwarded to Forest 2 Market) and the values obtained can be used to track timber sale prices regionally.

The Pre-Entry Conference

This meeting occurs on or before the first day of logging of any tract. The MFC sale manager or their designee will meet with the logger/buyer on site and review and sign the pre-logging form. The form is located in the timber sale tracker and must be signed prior to moving on the tract. It outlines things such as any known hazards, lease issues, fences, gates, points of entry, logging deck placement, skid trail placement, wet weather expectations and BMP requirements. A signed copy must be placed in the file once the meeting occurs.

If the sale is a PAC sale, a stack of "Load Reports" will be given to the logger. These forms will be kept in the loader at all times. Each load leaving the tract will be documented on these forms. The completed forms should be collected at least weekly from the logger and examined as described in the timber security section.

Timber Sale Security

MFC Pac Security Field Procedures

- Once Pre-logging conference has been completed and logging has begun Service Forester (SF) must notify the ADF and DF by email or phone
- Security Camera must be deployed within two days of logging. If possible the camera should remain up during the entire sale, but is not required
- Samples should be taken at various intervals during the sale and then reconciled to mill tickets. The minimum number of days the camera must be used to reconcile tickets:

Table 2: Minimum Number of Days The Camera Is Used To Reconcile Tickets

Sale Acres	Minimum Days
<40	2
41-70	3
71-100	5
101-150	7
151-200	10
201+	13

- When possible the camera should be deployed to assist in documenting the merchandising of timber on truck
- Upon visiting the site, examine Load Report at loader to see if loads exiting the site are being documented as they leave the site. Initial this report upon checking it
- PAC must be checked three times a week. All field checks must be documented using the form in the workbook
- All Post-Sale Cruise data must be run within three days of cruise and necessary communications made to logger/buyer about adjustments. If cruise cannot be run within three days, SF will seek assistance from ADF. All post cruise report must be filed into the timber sale file. Final post cruise data will be used to update geospatial stand data
- If any discrepancies are detected, they must be communicated to the logger immediately; also notice must be given to the ADF and DF
- Any questions or problems should be communicated to the DF or ADF
- Items to look for during the field visit and in the post-cruise results include:
 - Ensure that the target BA has been met
 - Thinning should remove more of the smaller diameter trees, thus increasing the average diameter of the stand that is left. We want a 1" gain in average DBH after a thin
 - Rutting should be no greater than 12" or logging operations should be stopped until better conditions exist
 - A tree is considered damaged if more than 25% of its bark face has been injured due to logging practices

MFC PAC Reconciliation Procedures

In order for the timber security program to be truly affective we must be able to reconcile tickets accurately and in a timely manner. After recent reviewing of current procedures there are several changes that will be made to better ensure that this occurs.

- Mill tickets will be arranged to be sent by the buyer to the District assigned Administrative Assistant (AA), as indicated by Timber Sale Contract. Receipt of the tickets starts the clock ticking – timely processing is of the essence
- The AA will first notify the SF and ADF by phone and/or email that mill tickets have been received. This must be done on the day of receiving the tickets
- The AA will then begin entering the tickets into the TSW; this must be completed that week. If the master timber sale file is located at the DO, copies will be made and forwarded within the same week
- The SF will decide which mill tickets need to be reconciled to the security photos and Load Reports. The AA will send the required mill tickets to the SF. This must be completed within two days of receiving tickets
- SF compares tickets to security camera photos and Load Reports. This must be completed within five days of receiving tickets
- This process will be documented in the TSW – any problems will be reported to the ADF and/or DF
- If the SF and/or his designee can't complete the process as scheduled, he will notify the ADF and ask for assistance
- Once the TSW has been completed it will be printed and a hard copy will be placed into the master timber sale file and a copy will be submitted to the Public Lands Program manager and to the designated FIST team member

Final Harvest Security Field Procedures

- Final harvest sites should be visited every day for the first two (2) days of logging and then once a week at a minimum thereafter. These visits should be documented in the TSW
- If a large rain event or soil conditions dictate a need for closer inspection, stands may be visited daily
- Rutting should be no greater than 12" or logging operations should be stopped until better conditions exist

Logger Evaluation and Harvest Summary

After any sale is complete, the sale manager must complete a "Logger Evaluation" form. This is located in the TSW. It addresses the basic functions and expectations of the logging job, as well as grades the logger on contract execution. A copy of this evaluation should be placed in the timber sale file when complete. If more than one logger is utilized for a particular sale, an evaluation should be filled out for each one.

The "Harvest Summary" is an in depth look at what has happened during a PAC sale. Lump sum sales only reflect the original cruise, but PAC sales show changes in tree counts, volumes, diameters, products and heights over the life of the sale. If all data are entered correctly, one can use this report to check that your target DBH, BA and TPA goals for a thinning have been met. It can also be used to examine how accurate your cruises were by contrasting pre and post cruise numbers. A copy of this should be kept in the timber sale file.

Timber Sale File Management

Copies of the following documents are required for all timber sales. There will be one copy at the County and one at the District level. These files will be kept for a period of 10 years following a sale:

- Copy of signed AFS for the timber sale
- The timber sale map
- Completed TSW (electronic copy)
- A printout of the pre-sale T-Cruise Volume (#1), Statistics (#40) and Value (#41) reports
- Cruise Audit Results (If applicable)
- The sale prospectus
- The advertisement
- The timber sale contract – signed copy
- The Forest Products Price Report
- The signed Pre-Logging form
- Weekly T-Cruise reports from PAC post-sale check cruise (If applicable)
- A printout of the post-sale T-Cruise Volume (#1) and Statistics (#40) reports (if PAC)
- A copy of all load reports (If PAC)
- A copy of all load tickets (If PAC)
- PAC Ticket Log (If PAC)
- A copy of all checks received from the buyer
- Timber Security Form (from TSW)
- Daily Harvest Inspection Form (from TSW)
- Logger evaluation Report (from TSW)
- Harvest Summary (from TSW)
- Copies of billing for the sale

APPENDIX

APPENDIX A - DEFINITIONS

- **Inoperable Stands** - where frequent or intense forest management cannot occur due to reasons such as a restricted area, topography limitations, no current access, standing water etc.
- **Manageable Stand** - any operable stand which is not designated as an SMZ
- **Streamside Management Zones (SMZ)** - forested stands that may be either Manageable or Inoperable depending on access, terrain, etc. If deemed manageable there are some limited management opportunities. All management activities must meet the Mississippi BMP standards.
- **Pine Stand** - is a stand of tree that contains >75 percent of the BA in pines.
- **Hardwood Stand** - is when the pine component is <25 percent of the BA of the standing trees.
- **Mixed Stand** - is when the pine component is between 25 percent and 75 percent of the BA of standing trees. These stands typically occur in high site index areas.
- **Compliance Check** - is when trees are checked directly after the planting job has been finished. This is done to ensure the entire tract meets specified planting requirements.
- **Survival Check** - is done at the end of the fall to get an accurate count of the trees that survived. This number is used to determine if re-planting is necessary and for future management decisions based on TPA numbers.

APPENDIX B - ABBREVIATIONS

- AA - Administrative Assistants
- ADF - Assistant District Forester
- AFS - Authorization For Service
- BA - Basal Area
- BOE - Board of Education
- DBH - Diameter Breast Height
- DF - District Forester
- DO - District Office
- FIST -
- MFC - Mississippi Forestry Commission
- SF - Service Forester
- SMZ - Streamside Management Zone
- TSW - Timber Sales Workbook

APPENDIX C - SCHOOL TRUST LANDS STATUTES

§ 29-3-47. Forestry Escrow Fund

For its services the state forestry commission shall be entitled to receive its actual expenses incurred in the discharge of the duties herein imposed. In order to provide funds with which to pay for the general supervision and sale of forest products, fifteen percent (15%) of all receipts from the sales of forest products shall be placed by the board in a forestry escrow fund and reserved to pay for work performed by the state forestry commission. Such payments shall be equal to the actual expenses incurred by the commission as substantiated by itemized bills presented to the board.

Money in the forestry escrow fund may be used to pay for any forestry work authorized during the period of the agreement and shall not be subject to lapse by reason of county budget limitations.

In each school district having need of tree planting and timber stand improvement, the board of education is authorized to place additional amounts in the forestry escrow fund to reimburse the state forestry commission for actual expenses incurred in performing this work, or to pay for any work done under private contract under the supervision of said commission. Such additional amounts may be made available from forest products sales receipts, funds borrowed from the sixteenth section principal fund as is provided for in Section 29-3-113, or any other funds available to the board of education excluding minimum foundation program funds. Expenditures from the forestry escrow fund for tree planting, timber stand improvement and other forestry work will be limited to payment for work recommended by the forestry commission and agreed to by the board of education.

When it becomes evident that the amount of money in the forestry escrow fund is in excess of the amount necessary to accomplish the work needed to achieve the goals set by the board of education and the forestry commission, the state forestry commission shall advise said board to release any part of such funds as will not be needed, which may then be spent for any purpose authorized by law.

§ 29-3-49. Agreements For Timber Improvement

It shall be the duty of the State Forestry Commission, in the manner provided in Section 29-3-45, to enter into agreements for timber improvement purposes with the board of education upon the request of the board. The contract shall provide for the carrying out of a long-term program of timber improvement, including any or all of the following: The deadening of undesirable hardwoods, the planting of trees, the cutting and maintaining of fire lanes, and the establishment of marked boundaries on all lands classified as forest lands in the agreements, which provide for the reimbursement of all current costs incurred by the State Forestry Commission and the carrying out of the duties required by such agreements. In the alternative, the commission, in its discretion, may have the option to contract with a private contractor, subject to the approval of the board, to perform this work under the supervision of the commission. Payment of the reimbursements as hereinabove set forth to the Forestry Commission, or of compensation due under any such contract with private contractors shall be made upon presentation of itemized bills by the commission or the private contractors, as the case may be, and may be made out of any sixteenth section funds to the credit of, or accruing to, any school district in which such work shall be done, or out of any other funds available to such district, excluding minimum foundation program funds.

§ 29-3-45. Management Of Forest Lands

(1) (a) The board of education shall, by order placed upon its minutes, enter into an agreement with the State Forestry Commission for the general supervision and management of all lands classified as forest lands and of all timber or other forest products under the control of the board on sixteenth section lands, and lieu lands which

have not been so classified. However, any school board may contract with private persons or businesses for the reforestation of sixteenth section lands and may contract with a registered forester to be paid from the 16th Section Interest Fund for a review of any forestry management decision or forestry practice including the sale of timber for sixteenth section forest land provided that any implementation of a forestry management decision or forestry practice to be taken as a result of the review described in this subsection shall be subject to the approval of both the commission and the Secretary of State. When such agreement has been entered into, no timber or other forest products shall be sold from any of the sixteenth section lands or lieu lands except such as have been marked or approved for cutting by the State Forestry Commission's employees. The Forestry Commission, or its designated employee, shall fix the minimum total cash price or minimum price per unit, one thousand (1,000) feet or other measure, at which the marked timber or other forest products shall be sold. The sales may be made for a lump sum or upon a unit price as in the opinion of the board may be calculated to bring the greatest return. Sales shall be made upon such other terms and conditions as to manner of cutting, damages for cutting of unmarked trees, damages to trees not cut and other pertinent matters as the board of education shall approve.

(b) The State Forestry Commission shall have the sole authority and control in scheduling of all cutting and harvesting of timber or other forest products when such timber stands or other forest products are determined by the State Forestry Commission to be economically ready for cutting and harvesting.

(c) Should a school board disagree with the Forestry Commission concerning the time of cutting and harvesting, the board may make an appeal to the Forestry Commission at a regular monthly scheduled meeting of the commission. If the school board is not satisfied after the appeal to the commission, the board may then appeal to the Secretary of State who will make the final decision as to the time for cutting and harvesting. In the event that the local school board is divested of its management authority under subsection (3) hereof, the Secretary of State after due consultation with the Forestry Commission shall retain the right to make final decisions concerning the management and sale of timber and other forest products.

(d) It is hereby made the duty of the State Forestry Commission, from time to time, to mark timber which should be cut from the lands, to determine what planting, deadening or other forestry improvements should be made, giving due consideration to food and habitat for wildlife, and to report to the appropriate board of education. The State Forestry Commission and the board of education shall supervise the cutting of any timber or harvesting of other forest products sold from the lands herein designated and shall have authority to require any timber-cutting operations on the lands to cease until proper adjustment is made, whenever it shall appear that timber is being cut in violation of the terms of the sale. In the event that it is desired to lease any of such lands or standing timber for turpentine purposes, such lease shall only cover such trees as the State Forestry Commission shall designate, and the commission through its employees shall approve the number of faces, method of chipping and boxing of such timber, and shall fix a minimum total cash price or minimum price per unit.

(e) No sale of any timber, turpentine or other forest products lease shall be made until notice of same shall have been published once a week for three (3) consecutive weeks in at least one (1) newspaper published in such county. The first publication of such notice shall be made not less than twenty-one (21) days prior to the date fixed for the sale, and the last publication shall be made not more than seven (7) days prior to such date. If no newspaper is published in such county, then such notice shall be given by publishing the same for the required time in some newspaper having a general circulation in such county and, in addition thereto, by posting a copy of such notice for at least twenty-one (21) days next preceding such sale at three (3) public places in such county.

(f) Notwithstanding the above provision pertaining to the sale of any timber, turpentine or other forest products, in the event that timber must be cleared from an existing road or existing utility right-of-way, the public notice requirement may be waived. Prior to waiver of the public notice requirement, the State Forestry Commission must make a finding that, due to the small area of timber to be cleared, a public notice sale would not be in the best interest of the local board of education. If the State Forestry Commission makes such a finding, then it shall set the value of the timber to be paid to the local board of education by the party requesting the timber be removed.

(g) Provided, however, in the case of damage by fire, windstorm or other natural causes which would require immediate sale of the timber, because the time involved for advertisement as prescribed herein would allow decay, rot or destruction substantially decreasing the purchase price to be received had not such delay occurred, the advertisement provisions of this section shall not apply. The local board of education, with a written recommendation from a designated employee of the State Forestry Commission filed in the minutes of the local board of education, shall determine when immediate sale of the timber is required. When the board of education shall find an immediate sale necessary for the causes stated herein, it shall, in its discretion, set the time for receipt of bids on the purchase of the timber, but shall show due diligence in notifying competitive bidders so that a true competitive bid shall be received.

(2) (a) A local board of education having control of the sixteenth section lands in the Hurricane Katrina Disaster of 2005 shall be granted emergency powers to take any and all actions of a reasonably prudent trustee acting under emergency conditions to recover damaged timber, prevent further loss or damage to timber, and to minimize economic loss. All such actions shall be taken in consultation with and shall be subject to the prior approval from the Secretary of State and the State Forestry Commission. The emergency powers shall be as follows:

(i) Contract with any individual or entity for management advice, sale of timber, clearing of damage to timber producing lands, transporting of timber, repairing access roads to timber lands, conducting aerial spraying, or taking any other type of action to prevent further loss of timber or diminution in value of existing timber as the result of the incident which necessitated the declaration of a natural disaster. In contracting with any individual or entity, the local board of education shall use its best efforts to ensure that all costs incurred are reasonable and that a fair price is received for all sales.

(ii) Enter into agreements with any individual, private company, or other governmental entities for the pooling of resources, or the sharing of costs so as to maximize the mitigation of loss and minimize the expense of mitigating the loss of timber.

(iii) Apply for any state, federal, or private party grant or nonrepayable funds to cover costs associated with emergency management contracts, sale timber, including loss for diminution of value, transporting of timber, replanting of timber, repairing access roads to timber, conducting aerial spraying, or reimbursement for any other action taken to prevent further timber damage, as well as mitigating the loss of funds due to damage.

(b) The emergency powers granted herein shall be for a period of one (1) year from the date of designation as a disaster area due to Hurricane Katrina. The emergency powers may be extended for one (1) additional one-year period upon prior written approval from the Secretary of State.

(c) The emergency powers shall also apply to the management of timber by the Secretary of State pursuant to subsection (3) of this section.

(d) In the event a local board of education is unable to acquire the services of the State Forestry Commission or the Secretary of State to meet an immediate need to salvage, remove or take other appropriate action on damaged timber, the local board of education shall unilaterally be granted the authority to take such actions as necessary regarding the management or sale of timber or other forest products.

(e) In exercising emergency powers, a local board of education or the Secretary of State shall exercise the general powers of a trustee with the same general restrictions and general liabilities of a trustee and shall exercise the care and skill of an ordinary prudent person to protect the beneficiaries of the trust under such emergency circumstances.

(f) Any contractor with a local board of education or the Secretary of State shall be entitled to rely on representations by such board of education or the Secretary of State as to who has authority to enter contracts for the management or sale of timber or other forest products, and reliance on such representations shall not be grounds for voiding any contract.

(3) (a) In the event that any member of a local board of education may have a personal interest, either direct or indirect, in the decisions regarding the management or sale of timber or other forest products or in a contract for the sale of timber or other forest products from sixteenth section school lands under the jurisdiction and control of the board, then the board of education shall automatically be divested of all authority and power to manage and sell timber or other forest products on sixteenth section lands under its control and jurisdiction. The divestiture shall extend for the period of service, and for one (1) year thereafter, of the board member having a direct or indirect personal interest in the sale or decision to sell timber or other forest products.

(b) During the time in which any local board of education may be divested of authority and power to manage and sell timber and other forest products, such authority and power shall be vested in the Secretary of State, as supervisory trustee of sixteenth section lands. Upon the appointment or election of a member of a local board of education who may have such an appointment or election of a member of a local board of education who may have such an interest in decisions and contracts regarding the management and sale of timber or other forest products, the board of education shall immediately notify the Secretary of State in writing. Likewise, the board shall give written notification to the Secretary of State within thirty (30) days prior to the expiration of any such divestiture period. Any contractor with a local board of education or the Secretary of State shall be entitled to rely on representations by such board or the Secretary of State as to who has authority to enter contracts for the management or sale of timber or other forest products, and reliance on such representations shall not be grounds for voiding any contract.

(c) The laws providing for the management and sale of timber and other forest products by local boards of education shall apply to the management and sale of timber and other forest products by the Secretary of State. The Mississippi Forestry Commission shall provide the Secretary of State with advice and services in the same manner as provided to local boards of education.

(d) The Secretary of State shall be paid all monies derived from the sale of timber or other forest products and shall promptly forward the same to the superintendent of education for such school district with instructions for the proper settlement, deposit and investment of the monies. Such local school board shall reimburse the Secretary of State for all direct costs relating to the management and sale of timber or other forest products, and in the case of a sale of timber or other forest products, the Secretary of State may deduct such direct cost from the proceeds of sale. The Secretary of State shall furnish an itemized listing of all direct cost charged to the local school district.

§ 29-3-31. Survey And Classification Of Lands In Choctaw Purchase

It is hereby made the duty of the board of education, using the services of all appropriate public agencies, to survey and classify all sixteenth section lands in the Choctaw purchase and lands granted in lieu thereof reserved for the support of township schools. Said lands shall be classified into eight (8) categories, as follows: (1) forest land; (2) agricultural land; (3) industrial land; (4) commercial land; (5) farm-residential land; (6) residential land; (7) recreational land; and (8) other land. The classifications shall be applied to said lands based upon the finding of the highest and best use of each parcel or tract for producing a maximum of revenue by proper utilization. In determining the highest and best use of these lands, the same principles shall be followed as are applied in determining the highest and best use of land in private ownership. Notwithstanding anything herein to the contrary, all land that is being used as "residential land" or "farm-residential land" shall continue to be classified as "residential land" or "farm-residential land" until such land ceases to be used as a residence.

§ 29-3-43. Improvements On Forest Lands

If any sixteenth section land is declared forest land at the end of a lease, the board of education shall make an appraisal and either pay a suitable amount to the lessee for the improvements or allow lessee to remove the same from the section land.